



## SEQUENCE LISTING

<110> Curtis, Rory A. J.

<120> 33410, A NOVEL HUMAN CARBOXYLESTERASE  
FAMILY MEMBER AND USES THEREOF

<130> 10448-081001

<140> US 09/934,323

<141> 2001-08-21

<150> US 60/226,774

<151> 2000-08-21

<160> 8

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 4667

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

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| atcccttct   | gtctgccccca | tccaaattcc  | tttgcctct   | tccacctctg  | tattttctg           | 120 |
| tctgtccgtc  | tgtctgtatc  | ctgcctccct  | gccccctctg  | ctccacccccc | cgcaggctgg          | 180 |
| gcctgccttc  | accttctccc  | acttccttcc  | ccttccccac  | cccgtgcccc  | ctccatggag          | 240 |
| aggaacagac  | cccttctctg  | tccagtctaa  | cccaggtccc  | tccccaaccc  | cctctccct           | 300 |
| ccttccccc   | cgccccctcct | ccctccctggg | gcgaggggggg | cctccctccc  | tctccccccc          | 360 |
| ttctctctct  | ctccgaggggg | gggggggtccc | agggaggggag | gggggggtccc | ccgatcagc           | 419 |
| atg tgg ctc | ctg gct     | tgt ctg     | gtg ggg     | ctg gct     | ggg gct             | 467 |
| Met Trp Leu | Leu Ala     | Leu Cys     | Leu Val     | Gly Leu     | Ala Gly Ala Gln Arg |     |
| 1           | 5           | 10          | 15          |             |                     |     |

|             |             |         |         |         |             |     |
|-------------|-------------|---------|---------|---------|-------------|-----|
| ggg gga ggg | ggt ccc ggc | ggc ggc | ccg ggc | ggc ccc | ggc ctg ggc | 515 |
| Gly Gly Gly | Gly Pro Gly | Gly Ala | Pro Gly | Gly Pro | Gly Leu Gly |     |
| 20          | 25          |         |         | 30      |             |     |

|             |             |             |         |         |                 |     |
|-------------|-------------|-------------|---------|---------|-----------------|-----|
| ctc ggc agc | ctc ggc gag | gag cgc ttc | ccg gtg | gtg aac | acg gcc tac     | 563 |
| Leu Gly Ser | Leu Gly Glu | Glu Arg     | Phe Pro | Val Val | Asn Thr Ala Tyr |     |
| 35          | 40          |             |         | 45      |                 |     |

|             |             |         |         |         |                     |     |
|-------------|-------------|---------|---------|---------|---------------------|-----|
| ggg cga gtg | cgc ggt     | gtg cgg | cgc gag | ctc aac | aac gag atc ctg ggc | 611 |
| Gly Arg Val | Arg Gly Val | Arg Arg | Glu Leu | Asn Asn | Glu Ile Leu Gly     |     |
| 50          | 55          |         | 60      |         |                     |     |

|             |             |         |         |         |                 |     |
|-------------|-------------|---------|---------|---------|-----------------|-----|
| ccc gtc gtg | cag ttc ttg | ggc gtg | ccc tac | gcc acg | ccg ccc ctg ggc | 659 |
| Pro Val Val | Gln Phe Leu | Gly Val | Pro Tyr | Ala Thr | Pro Pro Leu Gly |     |
| 65          | 70          |         | 75      |         | 80              |     |

|                                                                                                                                                       |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| gcc cgc cgc ttc cag ccg cct gag gcg ccc gcc tcg tgg ccc ggc gtg<br>Ala Arg Arg Phe Gln Pro Pro Glu Ala Pro Ala Ser Trp Pro Gly Val<br>85 90 95        | 707  |
| cgc aac gcc acc acc ctg ccg ccc gcc tgc ccg cag aac ctg cac ggg<br>Arg Asn Ala Thr Thr Leu Pro Pro Ala Cys Pro Gln Asn Leu His Gly<br>100 105 110     | 755  |
| gcu ctc ccc gcc atc atg ctg cct gtg tgg ttc acc gac aac ttg gag<br>Ala Leu Pro Ala Ile Met Leu Pro Val Trp Phe Thr Asp Asn Leu Glu<br>115 120 125     | 803  |
| gcu gcc gcc acc tac gtg cag aac cag agc gag gac tgc ctg tac ctc<br>Ala Ala Ala Thr Tyr Val Gln Asn Gln Ser Glu Asp Cys Leu Tyr Leu<br>130 135 140     | 851  |
| aac ctc tac gtg ccc acc gag gac ggt ccg ctc aca aaa aaa cgt gac<br>Asn Leu Tyr Val Pro Thr Glu Asp Gly Pro Leu Thr Lys Lys Arg Asp<br>145 150 155 160 | 899  |
| gag gcg acg ctc aat ccg cca gac aca gat atc cgt gac cct ggg aag<br>Glu Ala Thr Leu Asn Pro Pro Asp Thr Asp Ile Arg Asp Pro Gly Lys<br>165 170 175     | 947  |
| aag cct gtg atg ctg ttt ctc cat ggc ggc tcc tac atg gag ggg acc<br>Lys Pro Val Met Leu Phe Leu His Gly Gly Ser Tyr Met Glu Gly Thr<br>180 185 190     | 995  |
| gga aac atg ttc gat ggc tca gtc ctg gct gcc tat ggc aac gtc att<br>Gly Asn Met Phe Asp Gly Ser Val Leu Ala Ala Tyr Gly Asn Val Ile<br>195 200 205     | 1043 |
| gta gcc acg ctc aac tac cgt ctt ggg gtg ctc ggt ttt ctc agc acc<br>Val Ala Thr Leu Asn Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Thr<br>210 215 220     | 1091 |
| ggg gac cag gct gca aaa ggc aac tat ggg ctc ctg gac cag atc cag<br>Gly Asp Gln Ala Ala Lys Gly Asn Tyr Gly Leu Leu Asp Gln Ile Gln<br>225 230 235 240 | 1139 |
| gcc ctg cgc tgg ctc agt gaa aac atc gcc cac ttt ggg ggc gac ccc<br>Ala Leu Arg Trp Leu Ser Glu Asn Ile Ala His Phe Gly Gly Asp Pro<br>245 250 255     | 1187 |
| gag cgt atc acc atc ttt ggt tcc ggg gca ggg gcc tcc tgc gtc aac<br>Glu Arg Ile Thr Ile Phe Gly Ser Gly Ala Gly Ala Ser Cys Val Asn<br>260 265 270     | 1235 |
| ctt ctg atc ctc tcc cac cat tca gaa ggg ctg ttc cag aag gcc atc<br>Leu Leu Ile Leu Ser His His Ser Glu Gly Leu Phe Gln Lys Ala Ile<br>275 280 285     | 1283 |
| gcc cag agt ggc acc gcc att tcc agc tgg tct gtc aac tac cag ccg<br>Ala Gln Ser Gly Thr Ala Ile Ser Ser Trp Ser Val Asn Tyr Gln Pro<br>290 295 300     | 1331 |

|                                                                                                                                                       |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| ctc aag tac acg cgg ctg ctg gca gcc aag gtg ggc tgt gac cga gag<br>Leu Lys Tyr Thr Arg Leu Leu Ala Ala Lys Val Gly Cys Asp Arg Glu<br>305 310 315 320 | 1379 |
| gac agt gct gaa gct gtg gag tgt ctg cgc cgg aag ccc tcc cgg gag<br>Asp Ser Ala Glu Ala Val Glu Cys Leu Arg Arg Lys Pro Ser Arg Glu<br>325 330 335     | 1427 |
| ctg gtg gac cag gac gtg cag cct gcc cgc tac cac atc gcc ttt ggg<br>Leu Val Asp Gln Asp Val Gln Pro Ala Arg Tyr His Ile Ala Phe Gly<br>340 345 350     | 1475 |
| ccc gtg gtg gat ggc gac gtg gtc ccc gat gac cct gag atc ctc atg<br>Pro Val Val Asp Gly Asp Val Val Pro Asp Asp Pro Glu Ile Leu Met<br>355 360 365     | 1523 |
| cag cag gga gaa ttc ctc aac tac gac atg ctc atc ggc gtc aac cag<br>Gln Gln Gly Glu Phe Leu Asn Tyr Asp Met Leu Ile Gly Val Asn Gln<br>370 375 380     | 1571 |
| gga gag ggc ctc aag ttc gtg gag gac tct gca gag agc gag gac ggt<br>Gly Glu Gly Leu Lys Phe Val Glu Asp Ser Ala Glu Ser Glu Asp Gly<br>385 390 395 400 | 1619 |
| gtg tct gcc agc gcc ttt gac ttc act gtc tcc aac ttt gtg gac aac<br>Val Ser Ala Ser Ala Phe Asp Phe Thr Val Ser Asn Phe Val Asp Asn<br>405 410 415     | 1667 |
| ctg tat ggc tac ccg gaa ggc aag gat gtg ctt cgg gag acc atc aag<br>Leu Tyr Gly Tyr Pro Glu Gly Lys Asp Val Leu Arg Glu Thr Ile Lys<br>420 425 430     | 1715 |
| ttt atg tac aca gac tgg gcc gac cgg gac aat ggc gaa atg cgc cgc<br>Phe Met Tyr Thr Asp Trp Ala Asp Arg Asp Asn Gly Glu Met Arg Arg<br>435 440 445     | 1763 |
| aaa acc ctg ctg gcg ctc ttt act gac cac caa tgg gtg gca cca gct<br>Lys Thr Leu Leu Ala Leu Phe Thr Asp His Gln Trp Val Ala Pro Ala<br>450 455 460     | 1811 |
| gtg gcc act gcc aag ctg cac gcc gac tac cag tct ccc gtc tac ttt<br>Val Ala Thr Ala Lys Leu His Ala Asp Tyr Gln Ser Pro Val Tyr Phe<br>465 470 475 480 | 1859 |
| tac acc ttc tac cac cac tgc cag gcg gag ggc cgg cct gag tgg gca<br>Tyr Thr Phe Tyr His His Cys Gln Ala Glu Gly Arg Pro Glu Trp Ala<br>485 490 495     | 1907 |
| gat gcg gcg cac ggg gat gaa ctg ccc tat gtc ttt ggc gtg ccc atg<br>Asp Ala Ala His Gly Asp Glu Leu Pro Tyr Val Phe Gly Val Pro Met<br>500 505 510     | 1955 |
| gtg ggt gcc acc gac ctc ttc ccc tgt aac ttc tcc aag aat gac gtc<br>Val Gly Ala Thr Asp Leu Phe Pro Cys Asn Phe Ser Lys Asn Asp Val<br>515 520 525     | 2003 |
| atg ctc agt gcc gtg gtc atg acc tac tgg acc aac ttc gcc aag act                                                                                       | 2051 |

|                                                                 |     |      |     |
|-----------------------------------------------------------------|-----|------|-----|
| Met Leu Ser Ala Val Val Met Thr Tyr Trp Thr Asn Phe Ala Lys Thr |     |      |     |
| 530                                                             | 535 | 540  |     |
| ggg gac ccc aac cag ccg gtg ccg cag gat acc aag ttc atc cac acc |     | 2099 |     |
| Gly Asp Pro Asn Gln Pro Val Pro Gln Asp Thr Lys Phe Ile His Thr |     |      |     |
| 545                                                             | 550 | 555  | 560 |
| aag ccc aat cgc ttc gag gag gtg gtg tgg agc aaa ttc aac agc aag |     | 2147 |     |
| Lys Pro Asn Arg Phe Glu Glu Val Val Trp Ser Lys Phe Asn Ser Lys |     |      |     |
| 565                                                             | 570 | 575  |     |
| gag aag cag tat ctg cac ata ggc ctg aag cca cgc gtg cgt gac aac |     | 2195 |     |
| Glu Lys Gln Tyr Leu His Ile Gly Leu Lys Pro Arg Val Arg Asp Asn |     |      |     |
| 580                                                             | 585 | 590  |     |
| tac cgc gcc aac aag gtg gcc ttc tgg ctg gag ctc gtg ccc cac ctg |     | 2243 |     |
| Tyr Arg Ala Asn Lys Val Ala Phe Trp Leu Glu Leu Val Pro His Leu |     |      |     |
| 595                                                             | 600 | 605  |     |
| cac aac ctg cac acg gag ctc ttc acc acc acc acg cgc ctg cct ccc |     | 2291 |     |
| His Asn Leu His Thr Glu Leu Phe Thr Thr Thr Arg Leu Pro Pro     |     |      |     |
| 610                                                             | 615 | 620  |     |
| tac gcc acg cgc tgg ccg cct cgt ccc ccc gct ggc gcc ccg ggc aca |     | 2339 |     |
| Tyr Ala Thr Arg Trp Pro Pro Arg Pro Pro Ala Gly Ala Pro Gly Thr |     |      |     |
| 625                                                             | 630 | 635  | 640 |
| cgc cgg ccc ccg ccg cct gcc acc ctg cct ccc gag ccc gag ccc gag |     | 2387 |     |
| Arg Arg Pro Pro Pro Pro Ala Thr Leu Pro Pro Glu Pro Glu Pro Glu |     |      |     |
| 645                                                             | 650 | 655  |     |
| ccc ggc cca agg gcc tat gac cgc ttc ccc ggg gac tca cgg gac tac |     | 2435 |     |
| Pro Gly Pro Arg Ala Tyr Asp Arg Phe Pro Gly Asp Ser Arg Asp Tyr |     |      |     |
| 660                                                             | 665 | 670  |     |
| tcc acg gag ctg agc gtc acc gtg gcc gtg ggt gcc tcc ctc ctc ttc |     | 2483 |     |
| Ser Thr Glu Leu Ser Val Thr Val Ala Val Gly Ala Ser Leu Leu Phe |     |      |     |
| 675                                                             | 680 | 685  |     |
| ctc aac atc ctg gcc ttt gct gcc ctc tac tac aag cgg gac cgg cgg |     | 2531 |     |
| Leu Asn Ile Leu Ala Phe Ala Ala Leu Tyr Tyr Lys Arg Asp Arg Arg |     |      |     |
| 690                                                             | 695 | 700  |     |
| cag gag ctg cgg tgc agg cgg ctt agc cca cct ggc ggc tca ggc tct |     | 2579 |     |
| Gln Glu Leu Arg Cys Arg Arg Leu Ser Pro Pro Gly Gly Ser Gly Ser |     |      |     |
| 705                                                             | 710 | 715  | 720 |
| ggc gtg cct ggt ggg ggc ccc ctg ctc ccc gcc gcg ggc cgt gag ctg |     | 2627 |     |
| Gly Val Pro Gly Gly Pro Leu Leu Pro Ala Ala Gly Arg Glu Leu     |     |      |     |
| 725                                                             | 730 | 735  |     |
| cca cca gag gag ctg gtg tca ctg cag ctg aag cgg ggt ggt ggc     |     | 2675 |     |
| Pro Pro Glu Glu Leu Val Ser Leu Gln Leu Lys Arg Gly Gly Gly     |     |      |     |
| 740                                                             | 745 | 750  |     |
| gtc ggg gcg gac cct gcc gag gct ctg cgc cct gcc tgc ccg ccc gac |     | 2723 |     |
| Val Gly Ala Asp Pro Ala Glu Ala Leu Arg Pro Ala Cys Pro Pro Asp |     |      |     |

| 755                                                                                                                                                                         | 760 | 765 |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------|
| tac acc ctg gcc ctg cgc cg <sup>g</sup> gca cc <sup>g</sup> gac gat gt <sup>g</sup> cct ctc tt <sup>g</sup> gcc                                                             |     |     | 2771 |
| Tyr Thr Leu Ala Leu Arg Arg Ala Pro Asp Asp Val Pro Leu Leu Ala                                                                                                             |     |     |      |
| 770                                                                                                                                                                         | 775 | 780 |      |
| ccc ggg gcc ctg acc ctg ctg ccc agt ggc ctg ggg cca cc <sup>g</sup> cca ccc                                                                                                 |     |     | 2819 |
| Pro Gly Ala Leu Thr Leu Leu Pro Ser Gly Leu Gly Pro Pro Pro Pro                                                                                                             |     |     |      |
| 785                                                                                                                                                                         | 790 | 795 | 800  |
| cca cc <sup>g</sup> ccc ccc tcc ctt cat ccc ttc ggg ccc ttc ccc cc <sup>g</sup> ccc cct                                                                                     |     |     | 2867 |
| Pro Pro Pro Pro Ser Leu His Pro Phe Gly Pro Phe Pro Pro Pro Pro                                                                                                             |     |     |      |
| 805                                                                                                                                                                         | 810 | 815 |      |
| ccc acc gcc acc agc cac aac aac ac <sup>g</sup> cta ccc cac ccc cac tcc acc                                                                                                 |     |     | 2915 |
| Pro Thr Ala Thr Ser His Asn Asn Thr Leu Pro His Pro His Ser Thr                                                                                                             |     |     |      |
| 820                                                                                                                                                                         | 825 | 830 |      |
| act cg <sup>g</sup> gta taggggtgg gtggggag <sup>g</sup> cctcctcccc ggccctccct                                                                                               |     |     | 2964 |
| Thr Arg Val                                                                                                                                                                 |     |     |      |
| 835                                                                                                                                                                         |     |     |      |
| ggcccg <sup>g</sup> cca ctccgaaggc agggaggagg acttggcaac tggctttct cctgtggagt                                                                                               |     |     | 3024 |
| cg <sup>t</sup> cacacgc catccagcag cgctaagg <sup>t</sup> g gacatggat tc <sup>t</sup> ccctgc gatgcgtgtc                                                                      |     |     | 3084 |
| tttcccacgc agagaagccc cagtctt <sup>t</sup> tc tctggatctg ggc <sup>t</sup> ttgaa caactgggg                                                                                   |     |     | 3144 |
| gcgttttctc ccccccatt <sup>g</sup> ggacaccagt ct <sup>t</sup> cggtgtg tggaaatgtgg tattttcccg                                                                                 |     |     | 3204 |
| cgtggaggtg tgctttctca caacggggtg t <sup>t</sup> tttccca t <sup>t</sup> gtgcaggg <sup>t</sup> gaggttttt                                                                      |     |     | 3264 |
| tttgc <sup>t</sup> caccc tggacacat <sup>g</sup> ttggccccct caaagaattt ctgtggggat ttgtacccca                                                                                 |     |     | 3324 |
| gaatcctgtt ccccccattccc ttctccacc tc <sup>t</sup> ccccc <sup>t</sup> cc tccctcccc <sup>t</sup> tggagaccct                                                                   |     |     | 3384 |
| ggaagtgg <sup>t</sup> tg <sup>t</sup> tcacata cagt <sup>t</sup> gaccct tggccaccag accacagagg atggagcc <sup>t</sup> g                                                        |     |     | 3444 |
| ggaagcagcg aggaaatcac agccccctcg cccctgc <sup>t</sup> tc cttgcccc <sup>t</sup> accccoggcga                                                                                  |     |     | 3504 |
| agcatgttcc ccccgae <sup>g</sup> cc ccccttggca caagt <sup>t</sup> cat <sup>g</sup> gaagcac <sup>t</sup> tt ctgcgggg <sup>t</sup> ga                                          |     |     | 3564 |
| ggccctcacc ttccagagag gacagacaca gatttctgc tgggggaggg aggagtccac                                                                                                            |     |     | 3624 |
| gcatcct <sup>t</sup> at gctgc <sup>t</sup> tga agcttatttt cccgtggca ggacgcattt ctctgagtgg                                                                                   |     |     | 3684 |
| aaacaggtt <sup>c</sup> ttgc <sup>t</sup> atgtgg atgtgtgtt ccccaggc <sup>t</sup> g acggcccc <sup>t</sup> tc tcttcc <sup>t</sup> ccagc                                        |     |     | 3744 |
| acttccctgc ctccccccagg cctcaggccc agcacc <sup>t</sup> agt tc <sup>t</sup> ctc <sup>t</sup> cac atggcagg <sup>t</sup> g                                                      |     |     | 3804 |
| agcacagact tctagttggc aggagct <sup>t</sup> gag gagggtgaac aaacccc <sup>t</sup> gag ggaggccccgg                                                                              |     |     | 3864 |
| cccttgc <sup>t</sup> cc c <sup>t</sup> gagg <sup>t</sup> gggg ggagggggtg tggcaac <sup>t</sup> gtg cccccc <sup>t</sup> gc <sup>t</sup> g aggccac <sup>t</sup> gca            |     |     | 3924 |
| tgtttgacca aagccotcat t <sup>t</sup> gtgg <sup>t</sup> ccga ggacagc <sup>t</sup> tt ttccccaggc ctcagagcat                                                                   |     |     | 3984 |
| tgotc <sup>t</sup> atccg tgccaaact <sup>t</sup> g gtaggtgg <sup>t</sup> tttgagcgga aagactcc <sup>t</sup> ca aaatgtgc <sup>t</sup> ca                                        |     |     | 4044 |
| agaatttccc agtcccaggc agggcagg <sup>t</sup> gg aaactaagg <sup>t</sup> g caagcaggat acagggcgag                                                                               |     |     | 4104 |
| ggatgtgg <sup>t</sup> ca ggtgagg <sup>t</sup> gggg ctcccgct <sup>t</sup> g tgcccttct cctcaccat <sup>t</sup> g tctcccc <sup>t</sup> ac                                       |     |     | 4164 |
| cctgcctc <sup>t</sup> ag ttctccgttcc cccttcat <sup>t</sup> cc <sup>t</sup> gtccccct <sup>t</sup> ctttgaagct gtccccat <sup>t</sup> ct                                        |     |     | 4224 |
| c <sup>t</sup> gtgtcaga ccagc <sup>t</sup> ttct cctcatct <sup>t</sup> ga ccaccc <sup>t</sup> ct <sup>t</sup> ctgacc <sup>t</sup> gac <sup>t</sup> g cccctcc <sup>t</sup> tt |     |     | 4284 |
| gtctgaaaga aaggagc <sup>t</sup> tt gaatgg <sup>t</sup> gg <sup>t</sup> gggaggc <sup>t</sup> agt ggggagaaag gtctcacc <sup>t</sup> gg                                         |     |     | 4344 |
| acagg <sup>t</sup> ttggg agaatgagg <sup>t</sup> cagcggtgt <sup>t</sup> ggggaacaga tggagggggc agtggggaca                                                                     |     |     | 4404 |
| gggttgggc agacacc <sup>t</sup> g <sup>t</sup> agaataatt tgaaatgtgt <sup>t</sup> gaggtgact <sup>t</sup> cccggagg <sup>t</sup> gc                                             |     |     | 4464 |
| cttgggcttgc ggcatttggg aaaagaat <sup>t</sup> ga t <sup>t</sup> gtctggaaag ggcttaagg <sup>t</sup> acacagtgg <sup>t</sup> a                                                   |     |     | 4524 |
| cgagggggaga gtcctcat <sup>t</sup> ct <sup>t</sup> g <sup>t</sup> gtggcattt t <sup>t</sup> gtgggg <sup>t</sup> gt tagtgc <sup>t</sup> aaa cttgaatagg                         |     |     | 4584 |
| ggctgggg <sup>t</sup> gt ctgtcttcca ctgacaccc <sup>t</sup> aa aatccagaat ccctgg <sup>t</sup> ctt gagtcccaga                                                                 |     |     | 4644 |
| acttgc <sup>t</sup> tcc <sup>t</sup> tc ttgactgtcc ctc                                                                                                                      |     |     | 4667 |

<210> 2  
 <211> 835  
 <212> PRT  
 <213> Homo sapiens

&lt;400&gt; 2

Met Trp Leu Leu Ala Leu Cys Leu Val Gly Leu Ala Gly Ala Gln Arg  
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 Gly Gly Gly Pro Gly Gly Ala Pro Gly Gly Pro Gly Leu Gly  
 20 25 30  
 Leu Gly Ser Leu Gly Glu Glu Arg Phe Pro Val Val Asn Thr Ala Tyr  
 35 40 45  
 Gly Arg Val Arg Gly Val Arg Arg Glu Leu Asn Asn Glu Ile Leu Gly  
 50 55 60  
 Pro Val Val Gln Phe Leu Gly Val Pro Tyr Ala Thr Pro Pro Leu Gly  
 65 70 75 80  
 Ala Arg Arg Phe Gln Pro Pro Glu Ala Pro Ala Ser Trp Pro Gly Val  
 85 90 95  
 Arg Asn Ala Thr Thr Leu Pro Pro Ala Cys Pro Gln Asn Leu His Gly  
 100 105 110  
 Ala Leu Pro Ala Ile Met Leu Pro Val Trp Phe Thr Asp Asn Leu Glu  
 115 120 125  
 Ala Ala Ala Thr Tyr Val Gln Asn Gln Ser Glu Asp Cys Leu Tyr Leu  
 130 135 140  
 Asn Leu Tyr Val Pro Thr Glu Asp Gly Pro Leu Thr Lys Lys Arg Asp  
 145 150 155 160  
 Glu Ala Thr Leu Asn Pro Pro Asp Thr Asp Ile Arg Asp Pro Gly Lys  
 165 170 175  
 Lys Pro Val Met Leu Phe Leu His Gly Gly Ser Tyr Met Glu Gly Thr  
 180 185 190  
 Gly Asn Met Phe Asp Gly Ser Val Leu Ala Ala Tyr Gly Asn Val Ile  
 195 200 205  
 Val Ala Thr Leu Asn Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Thr  
 210 215 220  
 Gly Asp Gln Ala Ala Lys Gly Asn Tyr Gly Leu Leu Asp Gln Ile Gln  
 225 230 235 240  
 Ala Leu Arg Trp Leu Ser Glu Asn Ile Ala His Phe Gly Gly Asp Pro  
 245 250 255  
 Glu Arg Ile Thr Ile Phe Gly Ser Gly Ala Gly Ala Ser Cys Val Asn  
 260 265 270  
 Leu Leu Ile Leu Ser His His Ser Glu Gly Leu Phe Gln Lys Ala Ile  
 275 280 285  
 Ala Gln Ser Gly Thr Ala Ile Ser Ser Trp Ser Val Asn Tyr Gln Pro  
 290 295 300  
 Leu Lys Tyr Thr Arg Leu Leu Ala Ala Lys Val Gly Cys Asp Arg Glu  
 305 310 315 320  
 Asp Ser Ala Glu Ala Val Glu Cys Leu Arg Arg Lys Pro Ser Arg Glu  
 325 330 335  
 Leu Val Asp Gln Asp Val Gln Pro Ala Arg Tyr His Ile Ala Phe Gly  
 340 345 350  
 Pro Val Val Asp Gly Asp Val Val Pro Asp Asp Pro Glu Ile Leu Met  
 355 360 365  
 Gln Gln Gly Glu Phe Leu Asn Tyr Asp Met Leu Ile Gly Val Asn Gln  
 370 375 380  
 Gly Glu Gly Leu Lys Phe Val Glu Asp Ser Ala Glu Ser Glu Asp Gly  
 385 390 395 400  
 Val Ser Ala Ser Ala Phe Asp Phe Thr Val Ser Asn Phe Val Asp Asn  
 405 410 415  
 Leu Tyr Gly Tyr Pro Glu Gly Lys Asp Val Leu Arg Glu Thr Ile Lys  
 420 425 430  
 Phe Met Tyr Thr Asp Trp Ala Asp Arg Asp Asn Gly Glu Met Arg Arg  
 435 440 445

Lys Thr Leu Leu Ala Leu Phe Thr Asp His Gln Trp Val Ala Pro Ala  
 450 455 460  
 Val Ala Thr Ala Lys Leu His Ala Asp Tyr Gln Ser Pro Val Tyr Phe  
 465 470 475 480  
 Tyr Thr Phe Tyr His His Cys Gln Ala Glu Gly Arg Pro Glu Trp Ala  
 485 490 495  
 Asp Ala Ala His Gly Asp Glu Leu Pro Tyr Val Phe Gly Val Pro Met  
 500 505 510  
 Val Gly Ala Thr Asp Leu Phe Pro Cys Asn Phe Ser Lys Asn Asp Val  
 515 520 525  
 Met Leu Ser Ala Val Val Met Thr Tyr Trp Thr Asn Phe Ala Lys Thr  
 530 535 540  
 Gly Asp Pro Asn Gln Pro Val Pro Gln Asp Thr Lys Phe Ile His Thr  
 545 550 555 560  
 Lys Pro Asn Arg Phe Glu Glu Val Val Trp Ser Lys Phe Asn Ser Lys  
 565 570 575  
 Glu Lys Gln Tyr Leu His Ile Gly Leu Lys Pro Arg Val Arg Asp Asn  
 580 585 590  
 Tyr Arg Ala Asn Lys Val Ala Phe Trp Leu Glu Leu Val Pro His Leu  
 595 600 605  
 His Asn Leu His Thr Glu Leu Phe Thr Thr Thr Arg Leu Pro Pro  
 610 615 620  
 Tyr Ala Thr Arg Trp Pro Pro Arg Pro Pro Ala Gly Ala Pro Gly Thr  
 625 630 635 640  
 Arg Arg Pro Pro Pro Ala Thr Leu Pro Pro Glu Pro Glu Pro Glu  
 645 650 655  
 Pro Gly Pro Arg Ala Tyr Asp Arg Phe Pro Gly Asp Ser Arg Asp Tyr  
 660 665 670  
 Ser Thr Glu Leu Ser Val Thr Val Ala Val Gly Ala Ser Leu Leu Phe  
 675 680 685  
 Leu Asn Ile Leu Ala Phe Ala Ala Leu Tyr Tyr Lys Arg Asp Arg Arg  
 690 695 700  
 Gln Glu Leu Arg Cys Arg Arg Leu Ser Pro Pro Gly Gly Ser Gly Ser  
 705 710 715 720  
 Gly Val Pro Gly Gly Pro Leu Leu Pro Ala Ala Gly Arg Glu Leu  
 725 730 735  
 Pro Pro Glu Glu Leu Val Ser Leu Gln Leu Lys Arg Gly Gly  
 740 745 750  
 Val Gly Ala Asp Pro Ala Glu Ala Leu Arg Pro Ala Cys Pro Pro Asp  
 755 760 765  
 Tyr Thr Leu Ala Leu Arg Arg Ala Pro Asp Asp Val Pro Leu Leu Ala  
 770 775 780  
 Pro Gly Ala Leu Thr Leu Leu Pro Ser Gly Leu Gly Pro Pro Pro Pro  
 785 790 795 800  
 Pro Pro Pro Pro Ser Leu His Pro Phe Gly Pro Phe Pro Pro Pro Pro  
 805 810 815  
 Pro Thr Ala Thr Ser His Asn Asn Thr Leu Pro His Pro His Ser Thr  
 820 825 830  
 Thr Arg Val  
 835

<210> 3  
 <211> 2508  
 <212> DNA  
 <213> Homo sapiens

<400> 3

|             |             |             |             |             |             |      |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| atgtggctcc  | tggcgctgtg  | tctgggtgggg | ctggcgggggg | ctcaacgcgg  | gggagggggt  | 60   |
| cccgccggcg  | gcccggccgg  | cgccccggc   | ctggggctcg  | gcagcctcg   | cgaggagcgc  | 120  |
| ttcccggtgg  | tgaacacggc  | ctacgggcga  | gtgcgcggtg  | tgcgccgcga  | gctcaacaac  | 180  |
| gagatcctgg  | gccccgtcgt  | gcagttcttg  | ggcgtccct   | acgcccacgcc | gcccctggc   | 240  |
| gccccggct   | tccagccgccc | tgaggcgcgcc | gcctcggtgc  | ccggcgtgcg  | caacgcacc   | 300  |
| accctgccgc  | ccgcctgccc  | gcagaacctg  | cacggggcgc  | tgcccgccat  | catgtgcct   | 360  |
| gtgtggttca  | ccgacaactt  | ggaggcggcc  | gccacctacg  | tgccagaacca | gagcaggac   | 420  |
| tgccctgtacc | tcaacctcta  | cgtccccacc  | gaggacggtc  | cgctcacaaa  | aaaacgtgac  | 480  |
| gaggcgacgc  | tcaatccgccc | agacacagat  | atccgtgacc  | ctgggaagaa  | gcctgtatg   | 540  |
| ctgtttctcc  | atggcggttc  | ctacatggag  | gggaccggaa  | acatgttgc   | tggctcagtc  | 600  |
| ctggctgcct  | atggcaacgt  | cattgttagcc | acgctcaact  | accgtcttgg  | ggtgcgtcggt | 660  |
| tttctcagca  | ccggggacca  | ggctgcaaaa  | ggcaactatg  | ggctcttgg   | ccagatccag  | 720  |
| gccctgcgct  | ggctcagtg   | aaacatcgcc  | cacttgggg   | gcaaccccg   | gcgtatcacc  | 780  |
| atctttggtt  | ccggggcagg  | ggccctctgc  | gtcaacccctc | tgtatccttc  | ccaccattca  | 840  |
| gaagggctgt  | tccagaaggc  | catcgccca   | agtggcaccg  | ccatccatcg  | ctggctgtc   | 900  |
| aactaccagc  | cgctcaagta  | cacgcggctg  | ctggcagcca  | aggtgggtcg  | tgaccgagag  | 960  |
| gacagtgtcg  | aagctgtgga  | gtgtctgcgc  | cggaagccct  | cccgggagct  | ggtgaccag   | 1020 |
| gacgtgcagc  | ctgcccgtca  | ccacatcgcc  | tttggcccg   | ttgtggatgg  | cgacgtggc   | 1080 |
| cccgtatgacc | ctgagatcct  | catgcagcag  | ggagaattcc  | tcaactacga  | catgctcatc  | 1140 |
| ggcgtcaacc  | agggagaggg  | cctcaagttc  | gtggaggact  | otgcagagag  | cgaggacgg   | 1200 |
| gtgtctgcca  | gccccttga   | cttcactgtc  | tccaaacttt  | tggacaacct  | gtatggctac  | 1260 |
| ccggaaggca  | aggatgtgt   | tcgggagacc  | atcaagttt   | tgtacacaga  | ctggccgac   | 1320 |
| cgggacaatg  | gcaaatgcg   | ccgaaaacc   | ctgctggcgc  | tctttactga  | ccaccaatgg  | 1380 |
| gtggcaccag  | ctgtggccac  | tgccaagctg  | cacgcgcact  | accagtctcc  | cgtctacttt  | 1440 |
| tacaccttct  | accaccaactg | ccaggcggag  | ggccggcctg  | agtgggcaga  | tgcggcgcac  | 1500 |
| ggggatgaac  | tgccttatgt  | cttggcgtg   | cccatggtgg  | gtgccaccca  | cctttcccc   | 1560 |
| tgtacttct   | ccaagaatga  | cgtcatgctc  | agtggcgtgg  | tcatgaccta  | ctggaccaac  | 1620 |
| ttcggccaaga | ctggggaccc  | caaccagccg  | gtggccgagg  | ataccaagtt  | catccacacc  | 1680 |
| aagcccaatc  | gcttcgagga  | gggtgggtgg  | agcaattca   | acagcaagga  | gaagcgtat   | 1740 |
| ctgcacatag  | gcctgaagcc  | acgcgtgcgt  | gacaactacc  | gcccacaaca  | ggtggccttc  | 1800 |
| tggctggagc  | tcgtgcccc   | cctgcacaac  | ctgcacacgg  | agcttccac   | caccaccacg  | 1860 |
| cgcctgcctc  | cctacgcccac | gctggcccg   | cctcgcccc   | ccgctggcgc  | cccgggacca  | 1920 |
| cgcggggcccc | cgccgcctgc  | caccctgcct  | cccgagcccg  | agcccgagcc  | cggcccaagg  | 1980 |
| gcctatgacc  | gtttccccgg  | ggactcacgg  | gactactcca  | cgagactgag  | cgttaccgtg  | 2040 |
| gcccgtgggtg | cctccctct   | cttcctcaac  | atccctggct  | ttgctgcct   | ctactacaag  | 2100 |
| cgggaccggc  | ggcaggagct  | gctggcagg   | cggcttagcc  | cacctggcgg  | ctcaggctct  | 2160 |
| ggcgtgcctg  | gtggggccccc | cctgctcccc  | gcccggggcc  | gtgagctgcc  | accagaggag  | 2220 |
| gagctgggt   | caactgcagct | gaagcgggg   | ggtggcgtcg  | ggcgggaccc  | tgccgaggct  | 2280 |
| ctgcgcctg   | cctggccccc  | cgactacacc  | ctggccctgc  | gccgggcacc  | ggacgatgt   | 2340 |
| cctctcttgg  | ccccggggc   | cctgaccctg  | ctggccctgt  | gcctggggcc  | accgccaccc  | 2400 |
| ccaccggccc  | cctcccttca  | tcccttcggg  | ccctttcccc  | cgccccctcc  | caccggccacc | 2460 |
| agccacaaca  | acacgctacc  | ccaccccccac | tccaccactc  | gggtatag    |             | 2508 |

<210> 4  
<211> 585  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Consensus sequence

<400> 4  
Leu Leu Val Ala Thr Asn Asn Val Leu Cys Gly Lys Val Arg Gly Val  
1 5 10 15  
Asn Glu Lys Thr Asp Asn Gly Glu Gln Ser Val Tyr Ser Phe Leu Gly  
20 25 30  
Ile Pro Tyr Ala Glu Pro Pro Val Gly Asn Leu Arg Phe Lys Ala Pro

| 35                                                              | 40  | 45  |     |
|-----------------------------------------------------------------|-----|-----|-----|
| Gln Pro Tyr Lys Glu Pro Trp Ser Asp Val Leu Asp Ala Thr Lys Tyr |     |     |     |
| 50                                                              | 55  | 60  |     |
| Pro Pro Ser Cys Leu Gln Asp Asp Asp Phe Gly Phe Ser Leu Ser Asp |     |     |     |
| 65                                                              | 70  | 75  | 80  |
| Leu Lys Val Ala Leu Lys Met Leu Ser Leu Gly Trp Asn Lys Leu Val |     |     |     |
| 85                                                              | 90  | 95  |     |
| Gly Leu Lys Leu Ser Glu Asp Cys Leu Tyr Leu Asn Val Tyr Thr Pro |     |     |     |
| 100                                                             | 105 | 110 |     |
| Lys Asn Thr Lys Pro Asn Ser Lys Leu Pro Val Met Val Trp Ile His |     |     |     |
| 115                                                             | 120 | 125 |     |
| Gly Gly Gly Phe Met Phe Gly Ser Gly His Ser Leu Pro Leu Ser Leu |     |     |     |
| 130                                                             | 135 | 140 |     |
| Tyr Asp Gly Glu Ser Leu Ala Arg Glu Gly Asn Val Ile Val Val Ser |     |     |     |
| 145                                                             | 150 | 155 | 160 |
| Ile Asn Tyr Arg Leu Gly Pro Leu Gly Phe Leu Ser Thr Gly Asp Asp |     |     |     |
| 165                                                             | 170 | 175 |     |
| Lys Leu Pro Gly Ser Gly Asn Tyr Gly Leu Leu Leu Asp Gln Arg Leu |     |     |     |
| 180                                                             | 185 | 190 |     |
| Ala Leu Lys Trp Val Gln Asp Asn Ile Ala Ala Phe Gly Gly Asp Pro |     |     |     |
| 195                                                             | 200 | 205 |     |
| Asn Ser Val Thr Ile Phe Gly Glu Ser Ala Gly Ala Ala Ser Val Ser |     |     |     |
| 210                                                             | 215 | 220 |     |
| Leu Leu Leu Leu Ser Asn Gly Gly Asp Asn Pro Pro Ser Ser Lys Gly |     |     |     |
| 225                                                             | 230 | 235 | 240 |
| Leu Phe His Arg Ala Ile Ser Gln Ser Gly Ser Ala Leu Ser Pro Trp |     |     |     |
| 245                                                             | 250 | 255 |     |
| Ala Ile Gln Ser Glu Ser Asn Ala Arg Gly Arg Ala Lys Glu Leu Ala |     |     |     |
| 260                                                             | 265 | 270 |     |
| Arg Leu Leu Gly Cys Asn Glu Thr Ser Ser Ser Glu Leu Leu Asp Cys |     |     |     |
| 275                                                             | 280 | 285 |     |
| Leu Arg Ser Lys Ser Ala Glu Glu Leu Leu Glu Ala Thr Arg Ser Phe |     |     |     |
| 290                                                             | 295 | 300 |     |
| Leu Leu Phe Glu Tyr Val Pro Phe Leu Pro Leu Phe Leu Ala Phe Gly |     |     |     |
| 305                                                             | 310 | 315 | 320 |
| Pro Val Val Asp Gly Asp Asp Ala Pro Glu Ala Phe Ile Pro Glu Asp |     |     |     |
| 325                                                             | 330 | 335 |     |
| Pro Glu Glu Leu Ile Lys Glu Gly Lys Phe Ala Asp Val Pro Tyr Leu |     |     |     |
| 340                                                             | 345 | 350 |     |
| Ile Gly Val Thr Lys Asp Glu Gly Tyr Phe Ala Ala Met Leu Leu     |     |     |     |
| 355                                                             | 360 | 365 |     |
| Asn Ala Ser Ser Lys Gly Glu Asp Glu Leu Lys Lys Glu Thr Asn Pro |     |     |     |
| 370                                                             | 375 | 380 |     |
| Asp Val Trp Leu Glu Leu Lys Tyr Leu Leu Phe Tyr Ala Ser Glu     |     |     |     |
| 385                                                             | 390 | 395 | 400 |
| Ala Leu Asn Ile Lys Asp Met Asp Asp Leu Ala Asp Lys Val Leu Glu |     |     |     |
| 405                                                             | 410 | 415 |     |
| Lys Tyr Pro Gly Asp Val Asp Asp Phe Ser Val Glu Ser Arg Lys Pro |     |     |     |
| 420                                                             | 425 | 430 |     |
| Asn Leu Gln Asp Met Leu Thr Asp Leu Leu Phe Lys Cys Pro Thr Arg |     |     |     |
| 435                                                             | 440 | 445 |     |
| Val Ala Ala Asp Leu His Ala Lys His Gly Gly Ser Pro Val Tyr Ala |     |     |     |
| 450                                                             | 455 | 460 |     |
| Tyr Val Phe Asp His Pro Ala Ser Phe Gly Ile Gly Gln Phe Leu Ala |     |     |     |
| 465                                                             | 470 | 475 | 480 |
| Lys Arg Val Asp Pro Glu Phe Gly Gly Ala Val His Gly Asp Glu Ile |     |     |     |
| 485                                                             | 490 | 495 |     |

Phe Phe Val Phe Gly Asn Pro Leu Leu Lys Glu Gln Leu Tyr Lys Ala  
 500 505 510  
 Thr Glu Glu Glu Lys Ser Ser Lys Thr Met Met Asn Tyr Trp  
 515 520 525  
 Ala Asn Phe Ala Lys Thr Gly Asn Pro Asn Asn Gly Thr Ser Asn Gly  
 530 535 540  
 Leu Val Val Trp Pro Lys Tyr Thr Ser Glu Glu Gln Lys Tyr Ser Leu  
 545 550 555 560  
 Leu Ile Leu Leu Thr Thr Ile Thr Ala Gln Lys Leu Lys Ala Arg Asp  
 565 570 575  
 Pro Arg Lys Val Leu Cys Asn Phe Trp  
 580 585

<210> 5  
 <211> 836  
 <212> PRT  
 <213> Rattus norvegicus

<400> 5  
 Met Trp Leu Leu Ala Leu Cys Leu Val Gly Leu Ala Gly Ala Gln Arg  
 1 5 10 15  
 Gly Gly Gly Pro Gly Gly Ala Pro Gly Gly Pro Gly Leu Gly  
 20 25 30  
 Leu Gly Ser Leu Gly Glu Arg Phe Pro Val Val Asn Thr Ala Tyr  
 35 40 45  
 Gly Arg Val Arg Gly Val Arg Arg Glu Leu Asn Asn Glu Ile Leu Gly  
 50 55 60  
 Pro Val Val Gln Phe Leu Gly Val Pro Tyr Ala Thr Pro Pro Leu Gly  
 65 70 75 80  
 Ala Arg Arg Phe Gln Pro Pro Glu Ala Pro Ala Ser Trp Pro Gly Val  
 85 90 95  
 Arg Asn Ala Thr Thr Leu Pro Pro Ala Cys Pro Gln Asn Leu His Gly  
 100 105 110  
 Ala Leu Pro Ala Ile Met Leu Pro Val Trp Phe Thr Asp Asn Leu Glu  
 115 120 125  
 Ala Ala Ala Thr Tyr Val Gln Asn Gln Ser Glu Asp Cys Leu Tyr Leu  
 130 135 140  
 Asn Leu Tyr Val Pro Thr Glu Asp Gly Pro Leu Thr Lys Lys Arg Asp  
 145 150 155 160  
 Glu Ala Thr Leu Asn Pro Pro Asp Thr Asp Ile Arg Asp Ser Gly Lys  
 165 170 175  
 Lys Pro Val Met Leu Phe Leu His Gly Gly Ser Tyr Met Glu Gly Thr  
 180 185 190  
 Gly Asn Met Phe Asp Gly Ser Val Leu Ala Ala Tyr Gly Asn Val Ile  
 195 200 205  
 Val Ala Thr Leu Asn Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Thr  
 210 215 220  
 Gly Asp Gln Ala Ala Lys Gly Asn Tyr Gly Leu Leu Asp Gln Ile Gln  
 225 230 235 240  
 Ala Leu Arg Trp Leu Ser Glu Asn Ile Ala His Phe Gly Gly Asp Pro  
 245 250 255  
 Glu Arg Ile Thr Ile Phe Gly Ser Gly Ala Gly Ala Ser Cys Val Asn  
 260 265 270  
 Leu Leu Ile Leu Ser His His Ser Glu Gly Leu Phe Gln Lys Ala Ile  
 275 280 285  
 Ala Gln Ser Gly Thr Ala Ile Ser Ser Trp Ser Val Asn Tyr Gln Pro  
 290 295 300

Leu Lys Tyr Thr Arg Leu Leu Ala Ala Lys Val Gly Cys Asp Arg Glu  
 305 310 315 320  
 Asp Ser Thr Glu Ala Val Glu Cys Leu Arg Arg Lys Ser Ser Arg Glu  
 325 330 335  
 Leu Val Asp Gln Asp Val Gln Pro Ala Arg Tyr His Ile Ala Phe Gly  
 340 345 350  
 Pro Val Val Asp Gly Asp Val Val Pro Asp Asp Pro Glu Ile Leu Met  
 355 360 365  
 Gln Gln Gly Glu Phe Leu Asn Tyr Asp Met Leu Ile Gly Val Asn Gln  
 370 375 380  
 Gly Glu Gly Leu Lys Phe Val Glu Asp Ser Ala Glu Ser Glu Asp Gly  
 385 390 395 400  
 Val Ser Ala Ser Ala Phe Asp Phe Thr Val Ser Asn Phe Val Asp Asn  
 405 410 415  
 Leu Tyr Gly Tyr Pro Glu Gly Lys Asp Val Leu Arg Glu Thr Ile Lys  
 420 425 430  
 Phe Met Tyr Thr Asp Trp Ala Asp Arg Asp Asn Gly Glu Met Arg Arg  
 435 440 445  
 Lys Thr Leu Leu Ala Leu Phe Thr Asp His Gln Trp Val Ala Pro Ala  
 450 455 460  
 Val Ala Thr Ala Lys Leu His Ala Asp Tyr Gln Ser Pro Val Tyr Phe  
 465 470 475 480  
 Tyr Thr Phe Tyr His His Cys Gln Ala Glu Gly Arg Pro Glu Trp Ala  
 485 490 495  
 Asp Ala Ala His Gly Asp Glu Leu Pro Tyr Val Phe Gly Val Pro Met  
 500 505 510  
 Val Gly Ala Thr Asp Leu Phe Pro Cys Asn Phe Ser Lys Asn Asp Val  
 515 520 525  
 Met Leu Ser Ala Val Val Met Thr Tyr Trp Thr Asn Phe Ala Lys Thr  
 530 535 540  
 Gly Asp Pro Asn Gln Pro Val Pro Gln Asp Thr Lys Phe Ile His Thr  
 545 550 555 560  
 Lys Pro Asn Arg Phe Glu Glu Val Val Trp Ser Lys Phe Asn Ser Lys  
 565 570 575  
 Glu Lys Gln Tyr Leu His Ile Gly Leu Lys Pro Arg Val Arg Asp Asn  
 580 585 590  
 Tyr Arg Ala Asn Lys Val Ala Phe Trp Leu Glu Leu Val Pro His Leu  
 595 600 605  
 His Asn Leu His Thr Glu Leu Phe Thr Thr Thr Arg Leu Pro Pro  
 610 615 620  
 Tyr Ala Thr Arg Trp Pro Pro Arg Thr Pro Gly Pro Gly Thr Ser Gly  
 625 630 635 640  
 Thr Arg Arg Pro Pro Pro Ala Thr Leu Pro Pro Glu Ser Asp Ile  
 645 650 655  
 Asp Leu Gly Pro Arg Ala Tyr Asp Arg Phe Pro Gly Asp Ser Arg Asp  
 660 665 670  
 Tyr Ser Thr Glu Leu Ser Val Thr Val Ala Val Gly Ala Ser Leu Leu  
 675 680 685  
 Phe Leu Asn Ile Leu Ala Phe Ala Ala Leu Tyr Tyr Lys Arg Asp Arg  
 690 695 700  
 Arg Gln Glu Leu Arg Cys Arg Arg Leu Ser Pro Pro Gly Gly Ser Gly  
 705 710 715 720  
 Ser Gly Val Pro Gly Gly Pro Leu Leu Pro Thr Ala Gly Arg Glu  
 725 730 735  
 Leu Pro Pro Glu Glu Glu Leu Val Ser Leu Gln Leu Lys Arg Gly Gly  
 740 745 750  
 Gly Val Gly Ala Asp Pro Ala Glu Ala Leu Arg Pro Ala Cys Pro Pro

|                                                                 |     |     |
|-----------------------------------------------------------------|-----|-----|
| 755                                                             | 760 | 765 |
| Asp Tyr Thr Leu Ala Leu Arg Arg Ala Pro Asp Asp Val Pro Leu Leu |     |     |
| 770                                                             | 775 | 780 |
| Ala Pro Gly Ala Leu Thr Leu Leu Pro Ser Gly Leu Gly Pro Pro Pro |     |     |
| 785                                                             | 790 | 795 |
| Pro Pro Pro Pro Ser Leu His Pro Phe Gly Pro Phe Pro Pro Pro     |     | 800 |
| 805                                                             | 810 | 815 |
| Pro Pro Thr Ala Thr Ser His Asn Asn Thr Leu Pro His Pro His Ser |     |     |
| 820                                                             | 825 | 830 |
| Thr Thr Arg Val                                                 |     |     |
| 835                                                             |     |     |

<210> 6  
 <211> 550  
 <212> PRT  
 <213> Homo sapiens

|                                                                 |     |     |
|-----------------------------------------------------------------|-----|-----|
| <400> 6                                                         |     |     |
| Lys Ala Ile Ala Gln Ser Gly Thr Ala Ile Ser Ser Trp Ser Val Asn |     |     |
| 1                                                               | 5   | 10  |
| Tyr Gln Pro Leu Lys Tyr Thr Arg Leu Leu Ala Ala Lys Val Gly Cys |     |     |
| 20                                                              | 25  | 30  |
| Asp Arg Glu Asp Ser Ala Glu Ala Val Glu Cys Leu Arg Arg Lys Pro |     |     |
| 35                                                              | 40  | 45  |
| Ser Arg Glu Leu Val Asp Gln Asp Val Gln Pro Ala Arg Tyr His Ile |     |     |
| 50                                                              | 55  | 60  |
| Ala Phe Gly Pro Val Val Asp Gly Asp Val Val Pro Asp Asp Pro Glu |     |     |
| 65                                                              | 70  | 75  |
| Ile Leu Met Gln Gln Gly Glu Phe Leu Asn Tyr Asp Met Leu Ile Gly |     |     |
| 85                                                              | 90  | 95  |
| Val Asn Gln Gly Glu Gly Leu Lys Phe Val Glu Asp Ser Ala Glu Ser |     |     |
| 100                                                             | 105 | 110 |
| Glu Asp Gly Val Ser Ala Ser Ala Phe Asp Phe Thr Val Ser Asn Phe |     |     |
| 115                                                             | 120 | 125 |
| Val Asp Asn Leu Tyr Gly Tyr Pro Glu Gly Lys Asp Val Leu Arg Glu |     |     |
| 130                                                             | 135 | 140 |
| Thr Ile Lys Phe Met Tyr Thr Asp Trp Ala Asp Arg Asp Asn Gly Glu |     |     |
| 145                                                             | 150 | 155 |
| Met Arg Arg Lys Thr Leu Leu Ala Leu Phe Thr Asp His Gln Trp Val |     |     |
| 165                                                             | 170 | 175 |
| Ala Pro Ala Val Ala Thr Ala Lys Leu His Ala Asp Tyr Gln Ser Pro |     |     |
| 180                                                             | 185 | 190 |
| Val Tyr Phe Tyr Thr Phe Tyr His His Cys Gln Ala Glu Gly Arg Pro |     |     |
| 195                                                             | 200 | 205 |
| Glu Trp Ala Asp Ala Ala His Gly Asp Glu Leu Pro Tyr Val Phe Gly |     |     |
| 210                                                             | 215 | 220 |
| Val Pro Met Val Gly Ala Thr Asp Leu Phe Pro Cys Asn Phe Ser Lys |     |     |
| 225                                                             | 230 | 235 |
| Asn Asp Val Met Leu Ser Ala Val Val Met Thr Tyr Trp Thr Asn Phe |     |     |
| 245                                                             | 250 | 255 |
| Ala Lys Thr Gly Asp Pro Asn Gln Pro Val Pro Gln Asp Thr Lys Phe |     |     |
| 260                                                             | 265 | 270 |
| Ile His Thr Lys Pro Asn Arg Phe Glu Glu Val Val Trp Ser Lys Phe |     |     |
| 275                                                             | 280 | 285 |
| Asn Ser Lys Glu Lys Gln Tyr Leu His Ile Gly Leu Lys Pro Arg Val |     |     |
| 290                                                             | 295 | 300 |
| Arg Asp Asn Tyr Arg Ala Asn Lys Val Ala Phe Trp Leu Glu Leu Val |     |     |

|                                                                 |     |     |     |
|-----------------------------------------------------------------|-----|-----|-----|
| 305                                                             | 310 | 315 | 320 |
| Pro His Leu His Asn Leu His Thr Glu Leu Phe Thr Thr Thr Arg     |     |     |     |
| 325                                                             | 330 | 335 |     |
| Leu Pro Pro Tyr Ala Thr Arg Trp Pro Pro Arg Pro Pro Ala Gly Ala |     |     |     |
| 340                                                             | 345 | 350 |     |
| Pro Gly Thr Arg Arg Pro Pro Pro Ala Thr Leu Pro Pro Glu Pro     |     |     |     |
| 355                                                             | 360 | 365 |     |
| Glu Pro Glu Pro Gly Pro Arg Ala Tyr Asp Arg Phe Pro Gly Asp Ser |     |     |     |
| 370                                                             | 375 | 380 |     |
| Arg Asp Tyr Ser Thr Glu Leu Ser Val Thr Val Ala Val Gly Ala Ser |     |     |     |
| 385                                                             | 390 | 395 | 400 |
| Leu Leu Phe Leu Asn Ile Leu Ala Phe Ala Ala Leu Tyr Tyr Lys Arg |     |     |     |
| 405                                                             | 410 | 415 |     |
| Asp Arg Arg Gln Glu Leu Arg Cys Arg Arg Leu Ser Pro Pro Gly Gly |     |     |     |
| 420                                                             | 425 | 430 |     |
| Ser Gly Ser Gly Val Pro Gly Gly Pro Leu Leu Pro Ala Ala Gly     |     |     |     |
| 435                                                             | 440 | 445 |     |
| Arg Glu Leu Pro Pro Glu Glu Leu Val Ser Leu Gln Leu Lys Arg     |     |     |     |
| 450                                                             | 455 | 460 |     |
| Gly Gly Gly Val Gly Ala Asp Pro Ala Glu Ala Leu Arg Pro Ala Cys |     |     |     |
| 465                                                             | 470 | 475 | 480 |
| Pro Pro Asp Tyr Thr Leu Ala Leu Arg Arg Ala Pro Asp Asp Val Pro |     |     |     |
| 485                                                             | 490 | 495 |     |
| Leu Leu Ala Pro Gly Ala Leu Thr Leu Leu Pro Ser Gly Leu Gly Pro |     |     |     |
| 500                                                             | 505 | 510 |     |
| Pro Pro Pro Pro Pro Pro Ser Leu His Pro Phe Gly Pro Phe Pro     |     |     |     |
| 515                                                             | 520 | 525 |     |
| Pro Pro Pro Pro Thr Ala Thr Ser His Asn Asn Thr Leu Pro His Pro |     |     |     |
| 530                                                             | 535 | 540 |     |
| His Ser Thr Thr Arg Val                                         |     |     |     |
| 545                                                             | 550 |     |     |

<210> 7  
 <211> 16  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Exemplary motif

<221> VARIANT  
 <222> 2  
 <223> Xaa = Gly or Arg

<221> VARIANT  
 <222> 4-7, 9, 11, 13  
 <223> Xaa = Any amino acid

<221> VARIANT  
 <222> 8  
 <223> Xaa = Leu, Ile, Val, or Met

<221> VARIANT  
 <222> 10  
 <223> Xaa = Leu, Ile, or Val

<221> VARIANT

<222> 15

<223> Xaa = Ser, Thr, Ala, or Gly

<400> 7

Phe Xaa Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Xaa Ser Xaa Gly  
1 5 10 15

<210> 8

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Signature domain

<221> VARIANT

<222> 3, 7

<223> Xaa = any amino acid

<400> 8

Glu Asp Xaa Cys Leu Tyr Xaa  
1 5